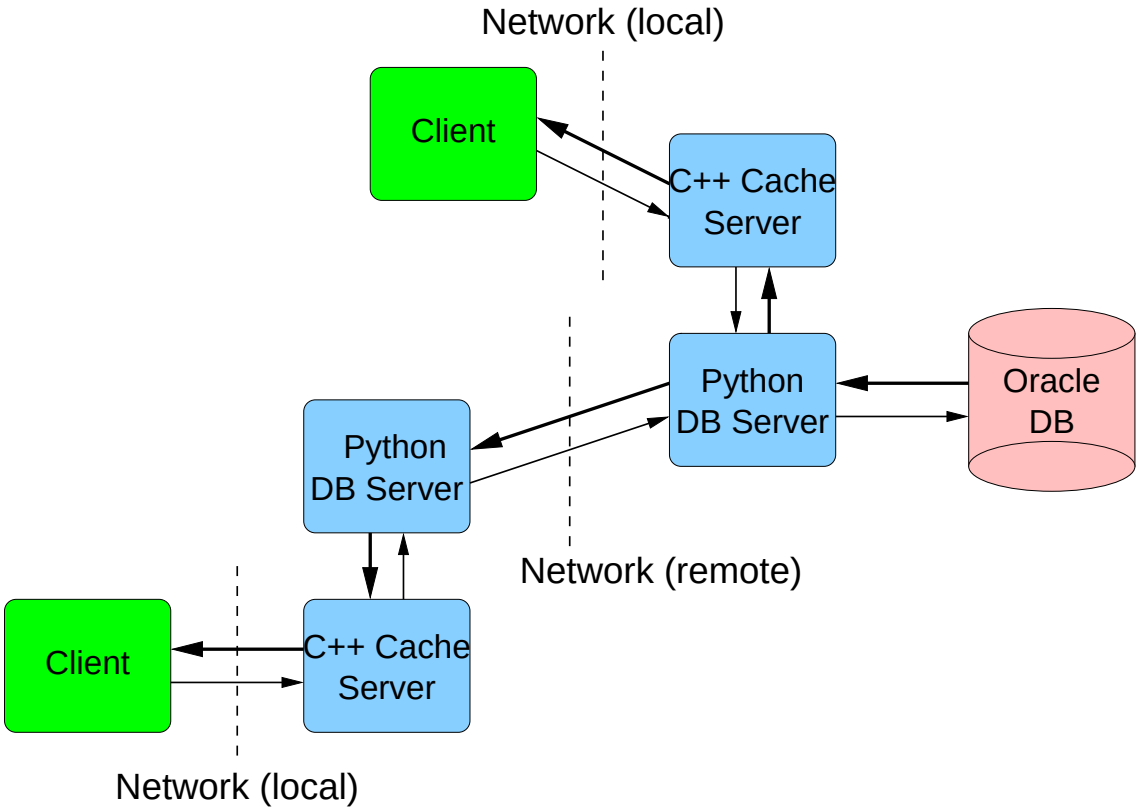
Data Base Proxy

- Proxy: DB queries are cached locally
  - minimize queries to cenral Oracle DB
  - reduce dependence on WAN: queries faster and more reliable



- communication via CORBA
- multi-level cache:
  - C++ server (RAM): faster and more compact
  - Python server (RAM and disk)

DB Configuration at GridKa

- DB proxies with both Python and C++ server (performance):
  - SMT
  - CFT
- DB proxies with Python server only:
  - CPS (now: added C++ server at FNAL)
  - Muon MDT, PDT, MSC
- DB proxies without local caching (since potentially changing):
  - DØ calibration
  - configuration (magnet etc., really changing?)
  - During production local caching should be enabled to minimize dependence on FNAL!
- All servers are running on a dedicated node (dual Xeon 2GHz, 1GB RAM)
  - Large memory consumption (e.g. 56 python processes)
- DB Servers register with local name service

Accessing DB from Application

- Servers contain an additional name-field ('gridka') to be distinguishable from FNAL servers.
- Running DØ framework software (e.g. DØReco) requires changes in 3 rcp files (user $\rightarrow$ gridka):
  - calibration_management/rcp/calibration_management.rcp
  - config_db_client/rcp/DBServers.rcp
  - mag_field_config/rcp/MagConfiguration_db.rcp
  - and additional checkout of d0reco rcps
- In principle possible to use same name for servers (thus eliminating the need for rcp modifications) when using different name server.
  - But dangerous procedure: e.g. once in the past the registration of the FNAL SAM DB server with FNAL name server was unintentionally replaced with a remote server.

Performance / Load Tests

- Tested by running parallel jobs (up to 45) over a picked dimuon sample
  - High load due to quickly changing runs in data files
  - Parallel processing of data-file containing 75 runs only accumulated $t_{wait} - t_{CPU} \approx 10$ min in 12h (only partly to be attributed to DB access)
- Significant decrease in processing time, if calibration constants are cached
- Proven to work for remote processing of RAW data without errors!
- Issues/problems:
  - DØ calibration and config constants could potentially change, i.e. remote access always needed, but could define a fixed set thus enabling local caching
  - CPS bad channel list not included included in DB. For each query the local CPS server tries to look up non-existent constants on the FNAL server and throws non-fatal exception (ignored by application, e.g. DØReco). Results in delays and calls for population of DB.

Installation Procedure

- well documented:

  `http://www-d0.fnal.gov/d0dist/dist/packages/calibration_db_server/devel/www`

- but configuration tedious (missing configuration script)
  - I provide a set of configuration files (which only need to be slightly modified) upon request.
- Firewall: open access to d0db-prd (a.k.a. d0ora2), d0dbsrv5, d0dbsrv6.
- DB proxy on WAN, preferably dedicated machine (¿=1GB) due to large memory consumption.
  - 50 concurrent python processes can potentially freeze your node!
- Sites (so far):
  - GridKa (completed installation and load tests in Feb.)
  - Lyon (installation completed, first tests)
  - WestGrid (just started?)